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Dr. Russell Targ
Stanford Research Institute
Menlo Park, California

Dear Russell,

Concerning the physics of the Geller effect and paranormal phenomena in general: I suspect the effect is quantum gravitational. Quantum fluctuations in the geometry of space-time destroy the common sense time ordering of the classical world. That is, to use Wheeler's ideas of superspace, there is not a well defined path in superspace (where each point is a 3-geometry). When quantum fluctuations are important it is impossible to "stack" the 3-geometries into a 4 dim space-time in a well ordered way. Psychic phenomena are a manifestation of quantum fluctuations in space-time geometry on a macroscopic scale. Also, you should be aware of the fact that general relativity is not consistent with simple notions of causality because of the TIME MACHINE effect of closed time-like curves. That is, the gravitational bending of light tips the light cones in such a way that a particle moving with v less than c can return to its original point in space-time but on a different sheet. Think of space-time as a Riemann surface of infinitely many sheets like that for $\log z$. The classical world is the result of constructive interference of these multiple universes or space-time sheets (e.g. Kruskal patches in Kerr solution). I have recently been able to reformulate Feynman's path integral concept of quantum mechanics in terms of this time-machine effect in a multisheeted curved space-time. That is, the wave-particle duality of quantum theory is an effect of the closed time-like curves. The reason there is a probability wave is that the electron is everywhere at once because it time tunnels on to different paths in space-time. Once we see that Nature uses time machines it is easy to see how an electron is both a particle and a wave. Psychic phenomena is simply time-tunneling on a macroscale. It should be possible to build time machines- literally!

I will now indicate how the quantum fluctuations in the space-time geometry can influence human perception. Perception works on the energy scale of 1 ev. The quantum fluctuations in the curvature are $R = (L^*/L^3)$ in a region of size L , where $L^* = (Gh/c^3)^{1/2} = 10^{-33}$ cm. The characteristic energy of the curvature fluctuations is $\hbar c R^{1/2} = E$. If $L = 10^{-13}$ cm, i.e. size of atomic nucleus, then (in c.g.s.) $R = 10^6$, $E = 10^{-27}(10^6 \cdot 10^{21})^{1/2} = 3 \times 10^{-14}$ erg or about 3×10^{-2} ev, taking L somewhat smaller e. about 10^{-14} cm. gives us E of order 1 ev. That is, quantum fluctuations in space-time geometry on the subnuclear scale of high energy physics i.e. 10^{-14} cm. produces quantum observable effects on the scale of 1 ev which can trigger human sensory organs. The radius of curvature of these subnuclear fluctuations is $a = R^{-1/2}$ which is of order 10^{-4} cm. Thus, I show that the radius of curvature of the subnuclear quantum gravity fluctuations is comparable to the size of a living cell! Indeed, one can think of these subnuclear quantum gravity fluctuations as creating a heavy graviton of mass about 1 ev, spin 2, which generates a short range strong gravitational field of range 10^{-4} cm (approx). I identify this new kind of Yukawa quantum gravitational field with the PSI field of paranormal experimentalists. Sarfatti's law: ESP signals are gravitational waves or electromagnetic waves. I suspect that Uri Geller can activate Josephson or gravitational radiation detectors at the University of Maryland. Indeed, Weber may not be detecting gravitational waves from the center of the galaxy at all. He may be detecting signals associated with paranormal phenomena. The secret to ESP is via gravitation. I can give a course on this if you desire? I am preparing a publication with details. Sinc. *Jack Sarfatti* JACK SARFATTI

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THE INTERACTION OF BIOPLASMIC FIELDS OF LIVING ORGANISMS WITH LIGHT PHOTON SOURCES

G. A. Sergiev and V. V. Kulagin

A number of theoretical experimental studies have been conducted to confirm the concept of biological plasma. The biological plasmic field is formed through interaction of delocalized (weakly bound) electrons and protons in the organism. It may enter into different modes of energetic interaction with other types of energetic particles, particularly with photons. We will discuss the results of an investigation which evaluated the modulation phenomena in the bioplasmic field caused by an interaction with light photons.

The effect of the light flow on the bioplasmic field of the brain may occur through a direct path, such as through irritation of sight receptors by light flashes, or indirectly by radiating the individual with the bioplasmic field of another subject who has been affected by a photic stimulator.

The effect of the direct modulation of the bioplasmic field of the brain was established by S. Uhin at the A. A. Zhdanov Leningrad University in 1966. The essence of the effect is such that during the action of the sources of flashing light with different frequencies f_1 and f_2 on the visual analyzers of the left and right eye, a modulation component appears in the encephalogram which is equal to the difference in frequency $\Delta f = f_1 - f_2$. The modulation component may also appear as a consequence of the interference of bioplasmic radiation of specialized neuron groups, related accordingly to the visual analyzers of the left and right eye.

It was shown that light flashes cause the combined frequencies f_{k1} and f_{k2} to appear in the electro-

encephalogram, which, depending upon the functional state of the brain, are related to the modulating frequency f in the form of the following:

$$\Delta f = f_k \quad - \text{linear relationship}$$

$$\Delta f = \sqrt{f_{k_1} \cdot f_{k_2}} \quad - \text{average geometric relationship}$$

$$f = f^2_k \quad - \text{quadratic (square) relationship}$$

The methodology that has been developed can be used to control the functional state of the brain. A method of indirect investigation of bioplasmic radiation effects on the human brain is part of the study of the correlated spectral characteristics of the subject's electroencephalogram during the moment of light photostimulation of the other individual, who is located in an isolated electroencephalographic enclosure at a distance of 50 meters from the subject.

During the procession of the electroencephalogram of the percipient's (subject's) brain, components were filtered out which coincided with the modulation frequency of the electroencephalogram of the inductor (who received direct stimulation) with a precision of 5 percent.

In order to verify directly that sources of light photons interact with the stimulated bioplasmic field of a human being, we developed the following method. A blindfolded subject, who was subjected to the sources of flashing light, was placed in an electroencephalographic chamber.

During the experiment, the radiations of electrical, magnetic and ionized fields were registered with the aid of sensitive detectors. The frequency of the radiated fluctuations made by the bioplasmic fields coincided exactly with the frequency of the

light source. This effect was discovered at low frequencies of up to 15 hertz. The conclusion was made that during stimulation by light photons, the bioplasmic field may reradiate energy in a wide range of physical waves. The same effect was confirmed during illumination of the bioplasmic field of a rabbit by the light source. The relationship of bioplasmic radiation with the light photons source was also investigated. It was established that at the moment of increased intensity of the bioplasmic radiation, the intensity of the light ray, at a distance of 1 meter from the subject, decreased to 6 decibels (twofold).

These investigations demonstrate the necessity of considering phenomena of bioplasmic radiation in living organisms during selected conditions of human functioning in a specific practical situation. At the same time, forms of bioplasmic field interaction are possible which may influence the stability of human locomotive functions.